CLAIMS

What is claimed is:

1. A method for detecting an amyloid peptide-related neurological disorder in a non-human animal model, the method comprising:

detecting a level of a calcium-responsive gene product in brain tissue of the animal model;

wherein detection of a level of calcium-responsive gene product in the brain tissue that differs from a level of the calcium-responsive gene product associated with a normal control animal is indicative of an amyloid peptide-related neurological disorder in the animal.

2. The method of claim 1, wherein the non-human animal model is an $hAPP_{FAD}/A\beta$ transgenic non-human animal model of Alzheimer's Disease.

3. The method of claim 1, wherein the brain tissue is a hippocampal brain sample.

4. The method of claim 3, wherein the brain tissue is a granule cell of the dentate gyrus.

5. The method of claim 1, wherein the calcium-responsive gene product is selected from a calbindin polypeptide, a neuropeptide Y polypeptide, an α-actinin II polypeptide, and a phospho-ERK polypeptide.

6. The method of claim 1, wherein the calcium-responsive gene product is selected from calbindin mRNA, neuropeptide Y mRNA, α-actinin II mRNA, and phosph-ERK mRNA.

7. The method of claim 1, wherein the neurological disorder is impaired spatial learning.

8. A method for identifying a candidate agent for treating an amyloid peptide-related neurological disorder, the method comprising:

administering a test agent to a non-human animal model of an amyloid peptide-related neurological disorder; and

detecting a level of a calcium-responsive gene product *in vitro* in brain tissue of the animal;

wherein detection of a level of calcium-responsive gene product in the brain tissue that differs significantly from a level of the calcium-responsive gene product in the absence of the agent indicates that the test agent is a candidate agent for treating an amyloid peptide-related neurological disorder.

9. The method of claim 8, wherein the non-human animal model is an $hAPP_{FAD}/A\beta$ transgenic non-human animal model of Alzheimer's disease.

10. The method of claim 8, wherein the brain tissue is a hippocampal brain sample.

11. The method of claim 10, wherein the brain tissue is a granule cell of the dentate gyrus.

12. The method of claim 8, wherein the neurological disorder is impaired spatial learning.

13. The method of claim 8, wherein the calcium-responsive gene product is selected from a calbindin polypeptide, a phospho-ERK polypeptide, and an α-actinin II polypeptide.

14. The method of claim 8, wherein the calcium-responsive gene product is selected from calbindin mRNA, phospho-ERK mRNA, and α-actinin II mRNA.

15. A method of detecting an amyloid peptide-related neurological disorder in a living subject, the method comprising administering to the subject a detectably labeled agent that binds a calcium-responsive gene product; and detecting binding between the agent and the calcium-responsive gene product in the dentate gyrus of the individual.